# Occlusion

**Occlusion:** is the relationship between the occlusal surfaces of the maxillary and the mandibular teeth when they are in contact .
The search for an ideal denture occlusion has been going on in a long time in dentistry & there are many theories of occlusion , all of them shared in achievement of masticatory efficiency, maximum stability & preservation of the underlying oral tissue.

**Centric occlusion**: is the relation of opposing occlusal surfaces of the teeth that provides the maximum intercuspation (tooth to tooth relation). In complete denture, it is desirable that the teeth to be in centric occlusion when the jaws are in centric relation (bone to bone relation) i.e centric occlusion must be in harmony with the centric relation even though this condition doesn't always occur in the natural dentition.

**Eccentric occlusion**: is the contacting of opposing occluding surfaces of the teeth when the jaws are in any other relation than centric relation.

**Balanced occlusion:** is described as the occlusal contacts of maxillary & mandibular teeth when the jaws are in either centric or eccentric relation.

**Working or function occlusion side:**in which buccal cusps of upper teeth meet buccal cusps of lower teeth & palatal cusps of upper teeth meet lingual cusps of lower teeth in lateral movement during mastication.

***Working side***

**Balancing occlusion side:** in this side, palatal cusp of upper teeth contact buccal cusps of lower teeth , such a contact during function help to maintain the denture in position during

lateral movements. As example, during left lateral movement, the left side of the dental arch becomes the working side and the right side becomes the balancing side.

***Balancing side***

**Protrusive balancing occlusion:** contacts in protrusive excursions permit the posterior teeth touch when the anterior teeth are in contact. This helps maintain denture stability. The distal inclines of the maxillary facial cusps contact the mesial inclines of the lower facial cusps. Protrusive balancing contacts may also occur on the lingual cusps.

***protrusive balancing occlusion***

## Concepts of occlusion for complete denture:

We should consider the concept of occlusion which we are going to adapt it during the arrangement of teeth.

**1- Neutro- centric or monoplane occlusion or flat plane concept:** using simple articulator & non-cusp form posterior teeth arranged in a flat plane without any curvature like the compensating curve and the occlusal plane is parallel to the residual ridges.

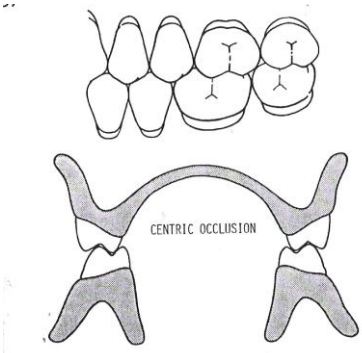
*Advantages: It provides freedom in centric occlusion & more stability of the dentures, it is used in class II & III occlusion.

*Disadvantages: the decreased chewing efficiency because of the absence of the cusps, decreased esthetic in premolar area because of the missing cusp & in anterior teeth region since the are set in edge to edge relation with out overbite or overjet.

**Neutro- centric**

**2- Balanced occlusion concept**: this is the ideal occlusion for complete denture , it can be defined as an occlusion which gives a harmonious and simultaneous contact between the teeth in centric and eccentric relation & in all mandibular movement to achieve stability of the denture within the functional limit.

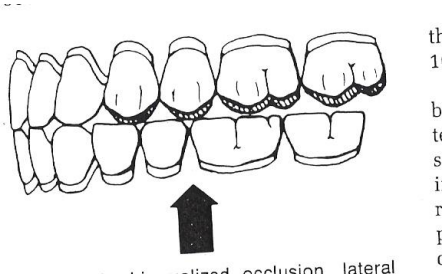
In our school we use this concept. It needs the use of cusp form posterior teeth (anatomic or semi anatomic teeth) & adjustable articulator.




**3- Lingualized occlusion concept**: This can combine components of both of the previous occlusal schemes like using of cusp form upper teeth & non-cusp form lower posterior teeth to get the advantages of both types of teeth & concepts .

The upper posterior teeth are set with buccal inclination so that the buccal cusp is out of occlusion in centric & lateral movements while their lingual cusps make in contact with the middle of the lower wide shallow fossa of non cusp form lower teeth .

*Advantages: freedom in centric relation, better stability because less cusps are involved in lateral & protrusive movements, better chewing efficiency because of the sharp upper lingual cusps.



**Indication of each type of the previous concepts:**

1. age of the patient: old age & geriatric patients need monoplane or lingualized concept because of their poor muscle tonicity while we can use balanced occlusion in young patients.
2. condition of oral health: patient with resorbed ridges or bad soft tissue condition like flabby ridge need monoplane or lingualized concept & we can use balanced concept in adverse conditions.
3. demand of the patient: esthetic & function demand need balanced or lingualized occlusion.
4. skill of the dentist & the technician: balanced occlusion need an experienced dentist & technician in using of the adjustable articulator & teeth setting.

## The try –in appointment

It is the fourth clinical step or appointment in complete denture construction. After the primary arrangement of the teeth on the bite rims, it is essential that the accuracy of the jaws relation records made with the bite rims be tested for the following:

- Check vertical dimension of occlusion and rest
- Prove centric relation record
- Posterior palatal seal
- Evaluate esthetics and phonetics
- Teeth position

**1. Vertical dimension:** Vertical dimension of rest(V.D.R) is measured first without trial dentures in patient mouth between a prominent points in patient chin & nose by a gauge or roller.

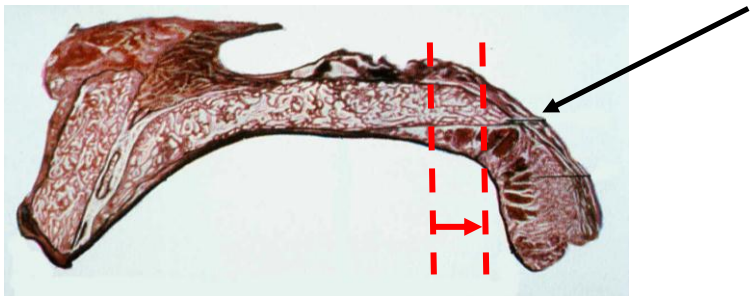
Then Vertical dimension of occlusion(V.D.O) is measured , maxillary & mandibular trial dentures are placed in the mouth, the mandible is guided to close into centric relation by the dentist's thumb placed directly on the anteroinferior portion of the patient's chin and the index fingers bilaterally on the buccal flanges of the lower trial denture while the patient pulls his lower jaw back as far as it will go and closes just until the back teeth make a feather touch with each other. Errors in centric relation can interfere with tests for vertical dimension.

V.D.O must be less than V.D.R by 2-4mm(free way space), if the difference is less than 2mm, this mean there is increased V.D.O but if the difference is more than 4mm this mean

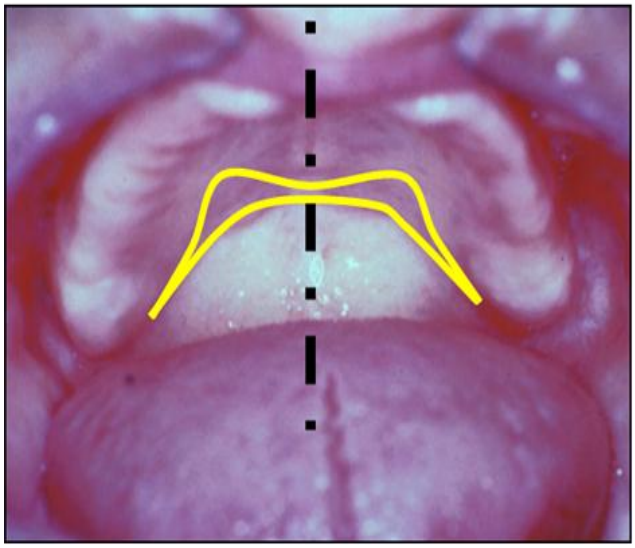
there is decreased V.D.O so it must be corrected from the incisal pin of the articulator & in the patient mouth by removing lower posterior teeth & put wax insteade of it & record the correct V.D.O then rearrange the teeth & check it again.

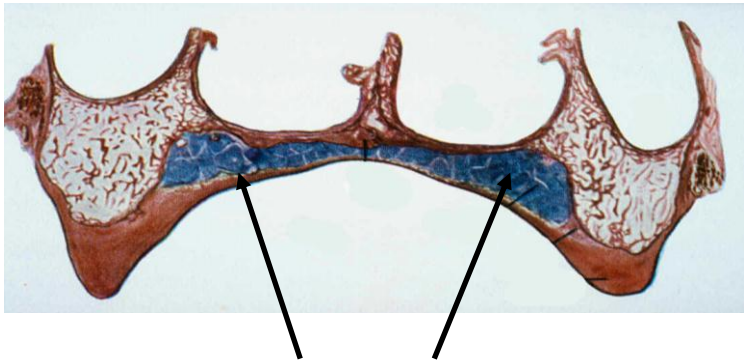
**2. Centric jaws relation(CR)** : test for accuracy of CR record involves the observation of intercuspation when the mandible is pulled back by the patient with the aid of the dentist as said before . All the teeth that occluded uniformly on the articulator must have equally uniform contacts in the mouth, if not this mean the CR record is incorrect (centric-off).
Factors that contribute to maxillomandibular relation recording inaccuracy (centric –off) are may be caused by biological difficulties arising from lack of patient muscle coordination &control or psychological difficulties because patient &/or dentist are tired or nervous that is difficult to get a relaxed position of the mandible. mechanical difficulties due to unstable & poorly fitting record bases & displaceability of denture bearing tissues. Also,materials consistency & equipments used in record making must not be too hard like impression plaster, Z.O.E paste & well-softened wax .Type of the articulator that used & finally incorrect recording technique or mounting used by the dentist & lack of dentist skill especially with difficult cases.

**3. Establishing the posterior palatal seal(p.p.s)of upper denture:** posterior palatal seal: defined as "the soft tissues along the junction of the hard and soft palates on which pressure within the physiological limits of the tissues can be applied by a denture to aid in the retention of the denture.



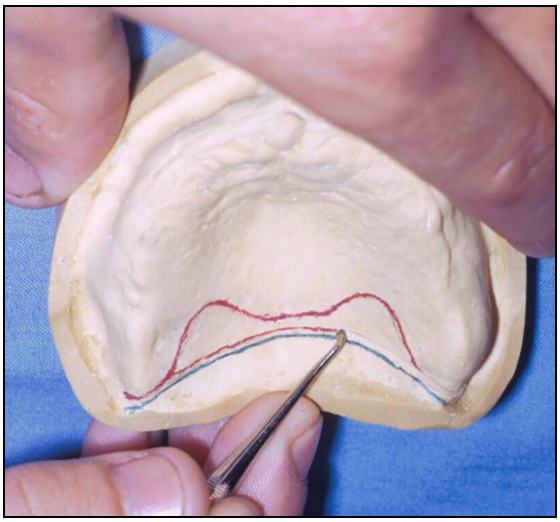

Posterior palatal seal area





Glandular tissue

Recording of posterior palatal seal is very important in retention to provide a peripheral seal. The denture posterior border which should rest on soft and resilient tissues, which can move along with the denture during function and prevent loss of peripheral seal refered as post dam or vibrating line. posterior border of upper denture is determined in the mouth & transferred onto the cast. The vibrating line of the soft palate is used as a guide to p.p.s , usually is located slightly anterior to fovea palatinae or on it, the dentist observes closely vibrating line when the patient say (ah) & marks it with an indelible pencile from one hamular notch to the other, the trial denture base is now inserted so that this line is transferred to it & the excess of the record base is reduced by a prosthetic handpiece to this line. Then is recorded & drawn on the cast & carved as a V-shaped groove with 1.5mm width at its base & sharp at its apex & 1-1.5mm deep . The groove will form a bead on the denture that provide p.p.s. Too wide p.p.s can push the denture downward gradually & break the seal. Too high p.p.s can make tissue soreness.



**4. Phonetic & esthetic:** the appearance of the entire lower half of the face & its anatomical landmarks depends on the dentures. The appearance of the patient premature aging may be caused by the lack of support for the lips & cheeks due to improper setting of teeth or decreased V.D.O. Over support of lips & cheeks by teeth or thick denture flanges or increased V.D.O also affects esthetic.

The teeth color, size, shape also must be checked with patient gender, age, personality & skin color with taking patient's desire, acceptance & attitude into consideration.

Phonetic is must be checked by the dentist which is affected by the V.D.O, overbite & overjet of anterior teeth , teeth position & tongue space.

*(s) sound is the most interesting sound from a dental point of view as is mainly influenced by the teeth & palatal part of the prosthesis & it is common in nearly all languages of the world. (s) sound is produced by a small space formed between the tongue tip & rugae area during its pronounceation , the size & the shape of this space determine the quality of the sound.

If the space is too small( as in the decreased V.D.O or thick palate of the denture) a whistle will result. If the space is too broad & thin , the (s) sound will be developed as (sh). If tongue tip touches upper anterior teeth, the result will be a lisped sound.

*insufficient support of the lips by the teeth or the denture base , thick labial flange, incorrect V.D.O & position of anterior teeth can affect the production of (b, p & m) sounds that are made by contact of the lips.

*(f & v) sounds are made between incisal edges of upper anterior teeth & the lower lip so length of anterior teeth or their position affect their production.

*(th) sound is made with the tip of the tongue extending slightly between upper & lower anterior teeth so position of anterior teeth & the excessive overjet that don't allow sufficient space for the tongue to protrude between the anterior teeth will affect its production.

**5. Teeth position:** finally the dentist must check that the anterior & posterior artificial teeth are arranged in their correct position in the articulator so that they will not cause cheek or tongue bite, or instability of the dentures. In addition, the five factors of occlusion must be checked with teeth setting like vertical & horizontal overlap, height of occlusal plane of lower trial denture, compensating & Willson's curves . Also , orientation of occlusal plane of upper trial denture must